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**Remarks**

Claims 1-34 are currently pending in the subject application, and claims 1-14 and 16-21 are presently under consideration. Claims 23-25, 27 and 29 have been amended herein to cure minor informalities. Claims 15 and 22-34 have been withdrawn – applicants' representative intends to rejoin a subset of these withdrawn claims upon allowance of the system claims that are under consideration. It is respectfully requested that the Examiner correct the status of the pending claims in accordance with the foregoing remarks since the Office Action incorrectly intimates that the non-elected claims have been cancelled.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

**I. Objections to Claims 23-27, 29 and 31**

Claims 23-27, 29 and 31 stand objected to - it is believed the herein amendments to correct claim dependencies cures any informalities associated with these claims. Accordingly, withdrawal of this objection is respectfully requested.

**II. Rejection of Claims 1-14, 16-21, 23-27, 29 and 31 Under 35 U.S.C. §103(a)**

Claims 1-14, 16-21, 23-27, 29 and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Bartlett (U.S. 4,907,151) in view of Benson *et al.* (U.S. 6,421,689). Claims 23-27, 29 and 31 are presently withdrawn - the following comments are presented in connection with claims 1-14 and 16-21, currently under consideration. It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Neither Bartlett nor Benson *et al.* teach or suggest each and every limitation of applicants' claimed invention.

To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable

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expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §706.02(j). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. See *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Independent claim 1 recites *an execution engine that declares at least one reference as pinned during execution of managed and unmanaged code*. The *as pinned reference* in the subject claim is guaranteed to be a pointer to an allocated memory segment. Applicants' claimed invention teaches pinning of the reference to prevent a garbage collection service from moving the referenced memory segment during a call from managed code to unmanaged code. Bartlett and Benson *et al.* do not teach or suggest this aspect of the subject invention. Rather, Bartlett and Benson *et al.* describe a method of garbage collection for use with ambiguous references. Bartlett and Benson *et al.* teach an ambiguous reference and an unambiguous reference. An ambiguous reference may be a pointer to an allocated memory segment *or it may be a data value*. An unambiguous reference is guaranteed to be a pointer to an allocated memory segment. The methods disclosed by the cited art are designed to prevent a *data value* that is interpreted as a pointer from being overwritten with a new value, which results when a memory segment is moved during garbage collection. Thus, both Bartlett and Benson *et al.* can result in memory being pinned that is actually available for reuse because it is pointed to by an ambiguous reference that is a *data value* - this results in wasted memory. The cited art merely describe pinning of ambiguous references to prevent a *data value* that is *interpreted as a pointer* from being overwritten during garbage collection. Bartlett and Benson *et al.* will *not* pin a reference that is guaranteed to be a pointer to an allocated memory segment, and therefore teaches away from applicants' claimed invention. See *In re Dow Chemical Co.*, 837 F.2d 469, 5 USPQ2d 1529 (Fed. Cir. 1988) ([T]eaching away from the art of the subject invention is a *per se* demonstration of lack of *prima facie* obviousness).

Neither Bartlett nor Benson *et al.* teach or suggest *declaring at least one reference as pinned* let alone *during execution of managed and unmanaged code* as recited in the subject claim. The Examiner takes official notice that it would have been obvious to one of

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ordinary skill in the art at the time the invention was made to *declare at least one reference as pinned during execution of managed and unmanaged code* as in applicants' claimed invention. Applicants' representative respectfully avers to the contrary, and requests that the Examiner produce a reference in support of such Official Notice pursuant to MPEP §2144.03, or in the alternative withdraw this rejection.

Claim 2 recites referencing *managed code during a call to unmanaged code*.

Contrary to assertions in the Office Action, Bartlett and Benson *et al.* do not describe this aspect of the subject claim. Bartlett merely describes a pointer that may be a local variable. Neither Bartlett nor Benson *et al.* describes pinning a reference to a managed object *during a call to unmanaged code*.

In regards to claim 3, the subject claim recites a *code manager that identifies the set of roots on the stack* and passes them to a garbage collection service. In applicants' claimed invention, the code manager can be a separate component from the garbage collection service. Neither Bartlett nor Benson *et al.* teach or suggest this aspect of the subject claim. Both Bartlett and Benson *et al.* describe identification of the set of roots as a component of the garbage collector.

In regards to claim 12, neither Bartlett nor Benson *et al.* describe an *execution engine operable to compile source code* and being able to *declare a reference as type pinned in the source code* as recited in the subject claim. Both Bartlett and Benson *et al.* describe pinning of ambiguous references by the system during garbage collection. The references that are to be pinned are determined by the system during execution of the garbage collection service, not specified in the source code as in applicants' claimed invention.

Claim 13 recites an *execution engine comprising a just-in-time compiler*. There is no mention or suggestion of just-in-time compiler(s) in either Bartlett or Benson *et al.*

Regarding claim 14, neither Bartlett nor Benson *et al.* describe *pinned references being limited to the stack* as recited in this claim. Bartlett describes references "typically stored in known locations (generally in the program stack or registers" and Benson *et al.* describes that "a root set is one or more areas of memory that contains references". These descriptions allow for pinned references to reside somewhere other than the stack.

In view of at least the above, it is respectfully submitted that the combination of Bartlett and Benson *et al.* do not make obvious the subject invention as recited in

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independent claim 1 (and claims 2-14 and 16-21 that depend there from). Accordingly, withdrawal of this rejection is respectfully requested.


CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,  
AMIN & TUROCY, LLP



Himanshu S. Amin  
Reg. No. 40,894

AMIN & TUROCY, LLP  
24<sup>TH</sup> Floor, National City Center  
1900 E. 9<sup>TH</sup> Street  
Cleveland, Ohio 44114  
Telephone (216) 696-8730  
Facsimile (216) 696-8731